

Mr. Michael Winka, Senior Policy Advisor for Smart Grid
New Jersey Board of Public Utilities
Division of Economic Development and Energy Policy
44 South Clinton Ave, PO Box 350
Trenton, NJ 08625-0350

July 16, 2013

OCE@bpu.state.nj.us

**RE: Combined Heat and Power/Fuel
Cell Comments**

Dear Mr. Winka:

On behalf of DCO/Energenic, I am pleased to offer comments in response to the questions posed at our last meeting regarding the development of a Combined Heat and Power (“CHP”) for critical New Jersey facilities.

DCO/Energenic and its affiliates continue to play a leadership role in New Jersey in the development of combined heat and power applications for both the public and private sectors as well as energy produced from landfill methane gas extraction and other renewable energy projects statewide. We appreciate the opportunity to support the work of Board Staff and to comment. We continue to believe that a collaborative approach to the development of public policy in these areas will go far to assist the Board in their ultimate policy decision-making process.

1. The current program requirements, per the FY 2014 filing, states that CHP systems and fuel cells with waste heat recovery must meet 65% Lower Heating Value (LHV) efficiency to qualify for an incentive. Fuel cells that, by design, only output electricity (no waste heat) can meet electric only efficiency of 50% LHV.

- a. Should fuel cells with waste heat output be able to qualify on electric efficiency only?
- b. If so, should the electric efficiency be less than (or more than) 50% LHV?
- c. If less than – what should the requirement be and should the rebate also be reduced?

DCO/Energenic believes that fuel cell technologies deserve appropriate consideration irrespective of LHV or energy efficiency standards. These considerations, however, should more importantly focus upon the utilization of these technologies as a best fit for the circumstances presented and upon the cost effective level of incentives required for their use in these applications.

2. The current program, per the FY 2014 filing, does not require systems to operate independently from the grid (islanding).

a. Should islanding and independent operation from the distribution grid be a requirement for public/critical facilities? (see the draft proposed definition below)

In order to create an effective critical asset hardening program that will provide maximum benefit at the lowest achievable cost, the State of New Jersey needs to develop a regional plan that would specifically delineate specific facilities or “one or more of the following” critical facilities from a regional list. This would both provide regional coverage to maximum public benefit and allow assets to be chosen on a cost benefit basis to minimize public expense. Once established, project developers and owners/operators of these “nominated” critical facilities could begin the detailed engineering analysis associated with design to balance the cost, and functionality assessments required to achieving the most cost effective result.

b. Should this be a requirement with no additional incentive or an additional incentive? What range if any?

Clearly, the infrastructure required to “harden” critical facilities will vary widely based upon the circumstances specific to existing facilities. The addition of additional distributed electric generation (likely natural gas reciprocating high duty cycle engines) to serve loads in excess of the electric generation resulting from the thermally balanced CHP unit would stand out as one of the most costly areas of required hardening equipment. Other costs, however, associated with “black start” capability, far more complicated utility interconnections and other subordinate equipment will add to these costs significantly as well. While it is difficult to point to exacting cost estimates due to the nature and scope of these retrofits being so inextricably tied to individual circumstances, costs of between 10% and 20% of the total capital required for standard CHP applications for these facilities should be expected.

c. Should this requirement differ depending on whether the host facility is new construction or existing building (variance of cost)?

Yes, of course, new facility design could be significantly less expensive

3. The current program requirements per the FY 2014 filing, states that CHP/ fuel cell system must be sized to meet all or a portion of the customer’s on-site load, not to exceed 100% of most recent historical annual consumption or

peak demand, although any surplus power that may become available during the course of a given year may be sold to PJM.

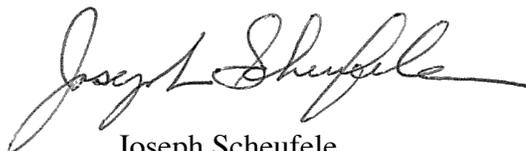
a. Should the program allow installations that exceed this sizing requirement (for example a system that is designed for 100% of the thermal load and therefore exceed the electric peak demand of the facility)?

While it is difficult to think of any potential New Jersey CHP application where the thermal load is so great that it would create excess electric generation at the site for sale back to PJM, there should be no blanket prohibition on the creation of this additional capacity resource generated at efficiency rates that exceed grid based supply resources.

b. Should the NJCEP incentive be limited to only that portion of the CHP/fuel cell that offsets on-site load, or should the incentive cover the additional power for export to the energy market over and above the on-site power needs?

We are not of the opinion that there is a universal answer to this question, each project / circumstance would need to be evaluated individually. For example, if the facility were to be constructed in a severely capacity restrained utility grid area, there may be a good public policy argument to be made for the fact that the addition of excess CHP capacity as a distributed generation resource at that location would create ratepayer benefits that would justify incentives.

DCO/Energenic appreciates the opportunity to provide these comments and looks forward to contributing to the CHP/FC working group in helping to resolve these issues and moving forward to protecting New Jersey's critical assets through the application of state of the art energy efficiency technologies.



Joseph Scheufele
Executive Vice President
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July 17, 2013

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Re: NJCEP CHP/FC Comments

Dear Mr. Winka,

Capstone Turbine and E-Finity Distributed Generation (“EDG”) appreciate the opportunity to submit comments in response to the BPU staff CHP/FC provisions.

E-Finity Distributed Generation is an EPA Combined Heat & Power partner, as well as the Authorized Mid-Atlantic and Southeastern U.S. Distributor for Capstone Turbine Corporation. We are actively promoting the use of Capstone’s “jet engine” technology to create onsite combined heat & power plants. With impending utility rate increases looming and questionable power reliability, Capstone MicroTurbines are providing customers with “green power” independence. Currently, Capstone is running more than 7,000 MicroTurbines worldwide logging millions of run hours. We appreciate the opportunity to comment on the CHP/FC Program and are appreciative that the Board of Public Utilities (“BPU”) is continuing the State’s goal of supporting and promoting CHP.

1. Fuel Cells with waste recovery and electric efficiency

- a. It is our position that Fuel Cells with waste heat recovery should not be able to qualify for electric efficiency only.
- b. The electric efficiency should be greater than 50% LHV and more in line with Combined Heat and Power efficiencies. Historically, Fuel Cell projects are less efficient, more expensive, and emit more CO₂ than comparable CHP projects. Typically, Fuel Cell efficiencies range from 40-60%¹ according to the U.S. Department of Energy, while Capstone’s MicroTurbine CHP have an overall efficiency of 75–80%. Capstone CHP technology saves 20–40% more of the natural gas energy than comparable Fuel Cells which actually waste anywhere from 40–60% of the natural gas fuel source that is not turned into

¹ U.S. Department of Energy, Fuel Cell Technologies Program. “Comparison of Fuel Cell Technologies,” Online at: http://www1.eere.energy.gov/hydrogenandfuelcells/fuelcells/pdfs/fc_comparison_chart.pdf. Accessed July 15, 2013.

electricity. Based on the California Public Utilities Commission's Self Generation Incentive Program 11th Year Impact Evaluation Final Report², Fuel Cell prices averaged \$8.97/watt versus \$3.79/watt for MicroTurbine CHP. The emissions of Fuel Cell units usually release over 900 pounds of CO₂ per megawatt hour (MWh) compared to our MicroTurbine CHP technology which only emits 625 pounds of CO₂/MWh at 75% efficiency. For comparison, the average megawatt hour of electricity generated in New Jersey for the entire year had only 713 pounds of carbon dioxide emissions according to the U.S. Environmental Protection Agency's (EPA) Egrid data.³ This fact alone demonstrates that it is greener to buy your electricity from the utility rather than installing an onsite Fuel Cell, while Capstone MicroTurbine CHP will actually be reducing CO₂ by 88 pounds/MWh on average. By incentivizing Fuel Cells more than MicroTurbine CHP technology, the New Jersey rate payers will be paying more money for a less efficient technology that will actually be increasing CO₂ emissions. It is our feeling that the BPU needs to invest public funds in projects that are the most cost effective and efficient.

2. Independent operation from the grid

- a. Islanding and independent operations from the distribution grid should be a requirement for public/critical facilities. Having independent operation requirements will allow these facilities to mitigate the impacts of an emergency by keeping their facilities running without interruption during a time when the utility grid is down. A report prepared for Oak Ridge National Laboratory by ICF International and staff from several of the U.S. Department of Energy's Regional Clean Energy Application Centers (CEACs) offers examples of critical infrastructure facilities that maintained onsite electric and thermal services during Superstorm Sandy with combined heat and power (CHP).⁴ Critical infrastructure (CI) collectively refers to those assets, systems, and networks that, if incapacitated, would have a substantial negative impact on national or regional security, economic operations, or public health and safety. While Superstorm Sandy caused extended power outages along the east coast of the United States, the examples in this study, and other critical facilities in the affected area with CHP, were able to continue their operations despite the emergency status of the power grid. A great example is Salem Community College in Salem County, New Jersey, which is a Red Cross Disaster Relief Shelter. During Hurricane Sandy, the shelter was fully operational as it was continuously powered and heated by three Capstone

² CPUC. "Self Generation Incentive Program 11th Year Impact Evaluation Final Report," Online at: http://www.cpuc.ca.gov/NR/rdonlyres/EC6C16C5-9285-4424-87CF-4A55B0E9903E/0/SGIP_2011_Impact_Eval_Report.pdf. Accessed July 15, 2013.

³ EPA. "Emissions and Generation Resource Integrated Database (eGRID)," Online at: <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>. Accessed July 15, 2013.

⁴ ICF. "Combined Heat and Power: Enabling Resilient Energy Infrastructure for Critical Facilities," Online at: https://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_critical_facilities.pdf. Accessed July 15, 2013.

C65 MicroTurbines that provide heating, cooling, and emergency power to the critical facility.

- b. There should be an additional incentive of \$0.50/watt to help alleviate the costs of additional engineering, equipment cost, relay switches, and electrical gear to prepare a facility for a dual mode installation. Dual mode installation allows the system to operate both with the grid and in island mode.

3. Sizing requirements for customer's energy consumption

- a. The program should allow for installations to meet 100% of the thermal requirement even when that would be over 100% of the electric requirement with the surplus electricity sold to the utility for use elsewhere on the grid to ensure efficient operation. The surplus electricity should be reimbursed to the host at full retail electric price.
- b. The incentive should only be available for onsite load and should not include export power.

Thank for considering our comments regarding the FY14 CHP/FC program.
Please feel free to contact me with any questions at 610-688-6212 x111.

Cordially,



Jeff Beiter
Managing Partner
Capstone Turbine Distributor
E-Finity Distributed Generation

July 19, 2013

Michael Winka
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Re: Response to the New Jersey Board of Public Utility's Request for Comments on Three (3) Provisions for the Fuel Cell and Combined Heat and Power (CHP) Program for Potential FY14 Implementation

Comments of ClearEdge Power

Dear Mr. Winka:

ClearEdge Power submits the following comments based on the public request from the New Jersey Board of Public Utilities related to three (3) program provisions for the FC/CHP program for FY2014 under the New Jersey Clean Energy Program (NJCEP).

Respectfully submitted,



Lisa C. Ward
Government Relations Manager

STATE OF NEW JERSEY

BOARD OF PUBLIC UTILITIES
ADDITIONAL PROVISIONS FOR THE FUEL CELL/CHP PROGRAM FOR FY14COMMENTS OF CLEAREDGE POWER**I. Introduction**

ClearEdge Power is a company headquartered in Sunnyvale, CA with manufacturing and office facilities in Hillsboro, OR and South Windsor, CT. ClearEdge Power is producing fuel cell systems for distributed energy generation that scale from 5kW to multiple megawatts. Through the use of combined heat and power, our ultra-clean and quiet stationary fuel cells are combustion free and meet the strictest air emissions requirements in the United States. PureCell® systems bridge environmental goals established by policy makers with consumers' need to save energy and money.

We offer the following as comments related to three (3) program provisions for the FC/CHP program for FY2014 under the New Jersey Clean Energy Program (NJCEP).

II. Comments**A. Fuel Cells With CHP Efficiency Hurdle****a. Should fuel cells with waste heat output be able to qualify for electric-only efficiency of 50% LHV?**

No. Electric only fuel cells and CHP fuel cells should be required to meet completely separate efficiency hurdles.

b. If so, should the electric efficiency be less than (or more than) 50% LHV?

No. The electric only fuel cell efficiency is sufficient for most known electric only projects in the State of New Jersey. However, in order to fully maximize the number of fuel cell projects utilizing byproduct thermal energy at different facilities, critical or not, the CHP efficiency requirement of 60% HHV (65% LHV) should be reconsidered. We fully support systems with high efficiencies; however, the 60% HHV does not necessarily return the best payback for most applications and therefore may limit the speed of deployment of fuel cells in New Jersey.

Under the current rules, a customer desiring to deploy a CHP fuel cell must burden the project with extra equipment and costs to meet the efficiency hurdle, even if the additional costs do not result in sufficient heating fuel savings that pays the initial costs back. As an example, the data center market is an excellent fit for CHP fuel cells, especially given their potential as critical facilities. Data center applications typically utilize byproduct heat to drive absorption chillers for cooling, which only takes advantage of the high grade heat produced by fuel cell systems. Due to this particular heat utilization profile, where only the high grade heat is needed, the 60%

HHV requirement is a difficult hurdle for project implementation without adding further costs to the project to also use some portion of the low grade heat. To overcome this obstacle more effectively, we would suggest a CHP efficiency requirement of 50% HHV (55% LHV). This efficiency requirement is similar to efficiencies that meet the requirements of the State of California's Self-Generation Incentive Program. While this is lower than the current 60% HHV efficiency requirement, an absorption chiller application using fuel cell waste heat can actually increase in efficiency over time, since the amount of chilling capacity increases over the life of the fuel cell.

c. If electric-only efficiency is less than 50% LHV, what should the requirement be and should the rebate also be reduced?

The State of New Jersey should strongly consider leaving the electric only efficiency hurdle unchanged and instead update the CHP fuel cell efficiency hurdle to 55% LHV to drive known market expansion for clean, on-site heat and power.

Slightly reducing the efficiency hurdle for CHP fuel cell in order to maximize the use of State funding should not be met with a reduced incentive. The current incentive does not fully cover the additional project costs if most end users are required to install extra equipment to attempt to meet the 65% LHV requirement. Even if the CHP fuel cell efficiency hurdle is slightly decreased, the State will risk continuing under utilization or complete abandonment of the program if the incentive is also lowered.

B. Grid Independent Capability

a. Should islanding and independent operation from the distribution grid be a requirement for public/critical facilities (see proposed definition)?

The NJBPU proposed critical facility definition reads:

"Public and Critical Facilities would be public facilities including federal, state, county or municipal and could include private hospitals or communication centers. The public and critical facilities would include police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities, and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster. The public and critical facilities would be able to provide shelter and sustenance 24/7 during and after an emergency."

The proposed definition is similar to language defined by other states. However, we would urge the State of New Jersey to expand their critical facility definition to more similarly match current resiliency initiatives, such as the microgrid program, in the State of Connecticut.

The Connecticut Legislature and Department of Energy and Environmental Protection (DEEP) provided an excellent "critical facility" definition as part of Public

Act 12-148 and the subsequent project feasibility application for the microgrid program. Connecticut Public Act 12-148 defines a critical facility as follows:

“Critical facility” means any hospital, police station, fire station, water treatment plant, sewage treatment plant, public shelter or correctional facility, any commercial area of a municipality, a municipal center, as identified by the chief elected official of any municipality, or any other facility or area identified by the Department of Energy and Environmental Protection as critical”.

Due to the passage of Public Act 12-148, DEEP released a microgrid project feasibility application which extended the definition of critical facilities to include:

“Military bases, communications towers, fueling stations, food distribution centers, and mass transit. In addition, DEEP considers as critical facilities those facilities that have some or all of the following characteristics: provide support for national security; act as a command center; act as an emergency shelter; provide access to food, fuel, money, or medication”.

To build upon the definitions provided by the State of Connecticut, ClearEdge Power would urge the State of New Jersey to also include the following facility types due to their inherent public benefit and emergency services capability:

- a. *Emergency Communication/Command Centers*
- b. *Ambulatory/Emergency Medical Services*
- c. *Emergency Management Services*
- d. *Facilities of Refuge*
- e. *Emergency Shelters and Rest Centers*
- f. *Public Utilities (Water, Gas, Electricity)*
- g. *Hospitals*
- h. *Managed Care Facilities*
- i. *Broadcasting/Public Information*
- j. *Telecommunications*
- k. *Airports and support infrastructure*

Any facility that due to its inherent layout or configuration, e.g., university campus, high school, etc., which can be used to provide public benefits such as shelter, remote emergency command centers, etc.

We would recommend the requirement be of the system’s capability to operate without the grid but would strongly discourage the State from requiring grid independent functionality for all fuel cell and CHP projects. To encourage resiliency and public safety, an additive incentive to the current base should be available for fuel cell and CHP projects that are configured to provide power during grid outages.

We are fully supportive and would encourage customers considering fuel cells to configure their systems to operate without the grid. However, requiring this configuration of all customer projects may ultimately deter use of the program by introducing undue cost for customers that do not have an inherent need for grid independent capability.

- b. Should this be a requirement with no additional incentive or an additional incentive? What range, if any?**

If the State stipulates grid independence as a requirement to participate in the fuel cell/CHP program, we suggest a further increase to the incentive of \$1 per installed watt to help defray the costs of additional equipment needed to provide the grid independent benefit. These increased incentives should only be considered in the short term (perhaps next 5 years) to help promote grid resiliency using clean distributed generation, like fuel cell systems.

- c. Should this requirement differ depending on whether the host facility is new construction or an existing building (variance of cost)?**

No. Any requirement and/or additional incentive for grid independent capability should not differ for new construction and existing buildings. It should be noted, however, that generally the integration of grid independent capability is less expensive for new construction versus a retrofit to an existing building. This is especially true if all stakeholders, including the distributed generation project manager, are involved in the planning process to ensure the design is streamlined for "least cost" integration of the power generation equipment.

C. Project Sizing For On-Site Demand

- a. Should the program allow installations that exceed the sizing requirement?**

Projects should not be limited by the current sizing requirement. However, without net metering for fuel cells or CHP systems, the end user is not necessarily incented to invest in larger on-site power generation if they cannot operate the equipment at 100% maximum output.

- b. Should the NJCEP incentive be limited to only that portion of the CHP/fuel cell that offsets on-site load, or should the incentive cover the additional power for export to the energy market over and above the on-site power needs?**

The additional power should be covered by the incentive. While covering the additional power will be a benefit to the public, it is with a relatively low return to the end user if net metering for fuel cells and CHP systems was allowed but was only at the avoided or generation rate.

III. Conclusion

Thank you for the opportunity to comment on several program provisions for the FC/CHP program for FY2014 under the New Jersey Clean Energy Program (NJCEP). We would be pleased to provide you with additional information or clarification as needed.

Respectfully Submitted:



By: _____

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July 19, 2013

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July 19, 2013

BY ELECTRONIC DELIVERY

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Re: **BPU Staff CHP/FC Comments**
CHP Grant Eligibility Criteria Questions from OCE

Comments of Public Service Electric and Gas Company

Dear Mr. Winka:

Please accept the following comments on behalf of Public Service Electric and Gas Company ("Public Service" or "PSE&G") in response to Board Staff's request concerning three provisions associated with the New Jersey Clean Energy Program's FY14 Combined Heat and Power and Fuel Cell ("CHP/FC") program.

With regard to efficiencies, the current program requirements state that CHP systems and fuel cells with waste heat recovery must meet a 65% Lower Heating Value ("LHV") efficiency to qualify for an incentive and fuel cells that only output electricity must meet a 50% LHV to qualify for an incentive. PSE&G believes that these levels of efficiency are consistent with the policy objectives of the Energy Master Plan ("EMP") and should not be changed. Although the EMP supports the expansion of CHP, with regard to fuel cells the EMP recognizes that "to date

the technical promise associated with this technology has been stymied by the high capital cost of installing the resource. Losses associated with the design and material selection in fuel cells have limited the efficiency of commercial units to roughly 40%, far lower than the theoretical efficiency underlying the technology.” (NJ EMP at 122). The EMP went on to recommend that “New Jersey should monitor technology progress regarding solid oxide fuel cells which has the potential to improve its economic and operational performance.” (NJ EMP at 134). In this sense the EMP recognized that, though potentially desirable, fuel cell technology is still in a ‘monitor’ phase due to its relative need to improve both economic and operating performance (i.e. efficiency). PSE&G believes that the 50% LHV efficiency level is supportive of this recommendation, as it would utilize ratepayer funds to incent fuel cell technology and applications that have increased operating efficiencies, rather than ‘lowering the bar’ and providing incentives to technology that has not yet ‘improved its economic and operational performance.’

With respect to requiring CHP/FC systems to operate independently from the grid (“islanding”), PSE&G must first note that the EMP clearly endorses the further development of CHP where net economic and environmental benefits can be demonstrated and the OCE’s current CHP program clearly supports this effort. However, if the Board now has an interest in ensuring that critical public and private facilities can remain operational during storms and other significant grid disruptions, and wishes to utilize CHP as one of several means to accomplish this, then the requirement for islanding capability is appropriate. Stated another way, the net benefits of providing incentives for CHP at public/critical facilities would be based solely on energy efficiency and not reliability in the absence of the ability for the public/critical facility to operate independently from the grid in the advent of a major event. In this regard, it should also

be noted that in many cases, because of the lack of a thermal load, CHP may not be the appropriate, cost-effective solution to ensuring public/critical facilities remain operational in the event of a major grid disruption. A backup generator of sufficient size to run boilers and/or air conditioning units and other critical circuits would accomplish the same objectives at a much lower cost.

Lastly, Board Staff has asked for comment regarding the current program requirement that CHP/FC systems be sized to meet all or a portion of the customer's on-site electric load, not to exceed 100% of most recent historical annual consumption. PSE&G continues to support this existing requirement as it believes ratepayer funds should not be used to invest in what would be the development of non-renewable wholesale generation. This also avoids potential Federal Energy Regulatory Commission ("FERC") jurisdictional issues that can complicate the OCE's program. Accordingly, PSE&G agrees with the current program requirements that limit NJCEP incentives for CHP/FC systems to the customer's on-site load, not to exceed 100% of most recent historical annual consumption.

CONCLUSION

PSE&G appreciates the opportunity to provide these comments and looks forward to continuing to contribute to the CHP/FC Working Group efforts.

Respectfully submitted,

By: *Alexander C. Stern*

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Dated: July 19, 2013

July 19, 2013

VIA ELECTRONIC AND REGULAR MAIL

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Re: Bloom Energy Corporation's Comments on the CHP/FC Program

Dear Mr. Winka:

On behalf of our client, Bloom Energy Corporation ("Bloom Energy"), please accept these comments regarding the current Combined Heat and Power ("CHP")/Fuel Cell ("FC") program ("CHP/FC Program") pursuant to the notice issued by the Board of Public Utilities ("Board") on June 24, 2013 ("Notice"). In addition to addressing the three issues outlined by the Board in the Notice, Bloom Energy will also use this opportunity to comment on the related CHP Long Term Financing Incentive Mechanism Proposal ("Financing Mechanism") issued by the Board on April 15, 2013, since Board Staff has indicated that the CHP/FC Program may be incorporated into or even replaced by the proposal set forth in the Financing Mechanism.

I. Electric Efficiency Requirements for Fuel Cells

With regard to the first question posed in the Notice, Bloom Energy believes that fuel cells, irrespective of design, that are deployed in an "all-electric" project format should be required to meet the proposed minimum electric efficiency of 50% Lower Heating Value ("LHV"). As the Board made clear in the Fiscal Year 2014 Budget Order¹ issued on June 21,

¹ *In the Matter of the Clean Energy Programs and Budgets for the Fiscal Year 2014*, Docket No. EO13050376V (June 21, 2013).

2013, although “reliability issues are certainly of major concern” to the Board, the Clean Energy Program is “designed to promote energy efficiency and renewable energy.” Maintaining the minimum electrical efficiency requirement at 50% LHV ensures that the Board’s energy efficiency objectives are supported.

II. Islanding Requirements

With regard to the second question in the Notice, Bloom Energy believes that automatic islanding should be a requirement of the CHP/FC Program but that absent an additional incentive, such a requirement would amount to a *reduction* in the current *per-project* incentive. Specifically, the proposed new requirement that every project “shall have the ability to automatically island/disconnect and operate independent from the utility in the event of substantial grid congestion, interruption, or failure” will impose new costs on New Jersey distributed generation projects. Without an enhancement of the incentive amount, this new requirement could create an obstacle to investment and rapid deployment of highly resilient on-site generation. Therefore, Bloom Energy believes that an additional incentive of approximately \$750/kW should be made available to projects that can automatically island/disconnect and operate independently from the utility.

With respect to public/critical facilities, Bloom Energy believes there is a serious misunderstanding embodied in Question 2a and the draft definition of Public and Critical Facilities. The title notwithstanding, the draft definition seems to assume that *only public facilities should be considered critical facilities*. This is simply not the case. In fact, some of the most critical facilities in terms of maintaining public security, public safety, government continuity, and mitigating the economic impacts of widespread power outages are operated by the private sector, but which provide an important service to the public. This fact is recognized in federal law and is detailed in PRESIDENTIAL POLICY DIRECTIVE/PPD-21,² the “Presidential Policy on Critical Infrastructure Security and Resilience” that is intended to

² <http://www.whitehouse.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil>

advance a national unity of effort to strengthen and maintain secure, functioning, and resilient critical infrastructure. The directive identifies sixteen critical infrastructure sectors, including *communications, financial services, food and agriculture, information technology, commercial and transportation* sectors amongst others. Indeed, “Government Facilities” is only one of the sixteen sectors recognized as critical infrastructure by the federal government.

The Board should align its program with the federal approach that includes important private sector facilities within the definition of critical facilities. During the next public emergency in New Jersey, millions of citizens and the government itself will attempt to rely upon a privately-owned telecommunications network to communicate, a privately-owned information technology sector to access data, and a privately-owned commercial sector to obtain food, clothes, and water. It will be to the lasting credit of the New Jersey Clean Energy Program if these types of private facilities are considered “critical facilities,” and have access to enhanced incentives enabling them to maintain resilient on-site power during widespread outages.

III. CHP/FC System Sizing

With regard to the third question in the Notice, Bloom Energy supports the requirement for equipment to be sized to serve all or a portion of the electrical load at the customer site. Bloom Energy further believes that for demand-metered customers, CHP and FC systems should be sized to meet no more than 100% of historical annual consumption or peak demand, and for non-demand metered customers, CHP and FC systems should be designed to meet no more than 125% of historical annual consumption. This sizing requirement ensures that projects receiving funding are truly providing the benefits of distributed generation.

One of the main benefits of sizing CHP and FC projects not to exceed electrical load is an improved transmission system. Behind-the-meter CHP and FC produce power locally, which aids the entire grid by reducing demand during peak times and by minimizing congestion of power on the network. When systems are oversized, these benefits are lost. Thus, Bloom Energy believes that the incentive should be limited to the portion of the CHP/FC project that offsets on-site load.

IV. CHP Long-Term Financing Mechanism

As the Board considers making changes to its current CHP/FC Program, it is important to consider the Financing Mechanism because Board Staff has suggested it will eventually replace the CHP/FC Program and incorporate many of the programmatic elements that have been set forth in the Notice. Bloom Energy continues to have serious concerns that the proposed Funding Mechanism has designated CHP as the exclusive technology in which Electric Distribution Companies (“EDCs”) and Gas Distribution Companies (“GDCs”) shall fulfill their energy efficiency portfolio standards (“EEPS”) under the Proposal. While Sections (g) and (h) of N.J.S.A. 48:3-87 authorize the Board to require the EDCs and GDCs to “implement energy efficiency measures” that reduce “electricity usage” and “natural gas heating usage” by 20%, the Proposal does not specify what types of “energy efficiency measures” should be taken by the EDCs and GDCs. Nor does the statute provide that the Board should only support energy efficiency measures which produce reductions in *both* electrical and natural gas heating usage by 20%. Rather, the statute separately authorizes the Board: (1) to require the EDCs to take measures promoting electrical efficiency; and/or (2) to require the GDCs to take measures promoting natural gas heating efficiency. Therefore, the decision to rely on CHP as the exclusive “energy efficiency measure” in the Financing Mechanism is clearly a policy choice: a policy choice that will have the effect of depriving an important group of customers from participating in the financing incentive mechanism

While CHP is certainly a significant “energy efficiency measure”, it is not the *only* “energy efficiency measure” that the Board should be encouraging through this long term financing mechanism. Rather, the Board should include various energy efficient technologies, including all-electric fuel cells. All-electric fuel cells represent the single cleanest and most resilient form of on-site power for many critical electric customers that are smaller or very often do not have a matching thermal load like many supermarkets, retail stores, telecommunications providers, data centers, government facilities, and nursing homes, amongst others. Especially in

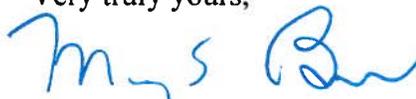
Michael Winka
July 19, 2013
Page 5 of 5

the wake of Superstorm Sandy, these are the very types of customers the state should be encouraging to install reliable distributed generation through its financing proposals.

Moreover, if the Board does not allow for an expansion of eligibility to include all-electric fuel cells, the same electric customers that will be *denied the opportunity to participate* in the program by virtue of the fact that they may not have a thermal load suitable for CHP *will be required to finance the costs* of the program under the current Proposal. The Board should broaden eligibility to include all-electric fuel cells in order to avoid this plainly unfair result and expand program benefits to a larger base of customers.

Bloom Energy appreciates the opportunity to comment on these important matters. Please do not hesitate to contact me should you have any questions or need any further information. Thank you.

Very truly yours,



Murray E. Bevan

Comments of Jersey Central Power & Light Company (“JCP&L”)
on the NJCEP CHP/FC program

July 19, 2013

1. The current program requirements, per the FY 2014 filing, states that CHP systems and fuel cells with waste heat recovery must meet 65% Lower Heating Value (LHV) efficiency to qualify for an incentive. Fuel cells that, by design, only output electricity (no waste heat) can meet electric only efficiency of 50% LHV.

- a. Should fuel cells with waste heat output be able to qualify on electric efficiency only?

JCP&L Response: No, if it is not CHP (meeting the 65% LHV efficiency), fuel cells should not qualify for CHP incentives. Electricity only fuel cells should not be eligible for CHP incentive levels unless they meet the existing CHP requirements. There should not be incentives for CHP that does not at least meet the PURPA standard for the ratio of thermal consumption. Without an appropriate application, CHP is less efficient than central station power; thus, there needs to be an overall efficiency improvement or these programs are subsidized fuel switching.

The approach should be market-based to procure CHP, and potential incentive mechanisms should require a cost-effectiveness analysis.

- b. If so, should the electric efficiency be less than (or more than) 50% LHV?

JCP&L Response: See response to section a.

- c. If less than – what should the requirement be and should the rebate also be reduced?

JCP&L Response: See response to section a.

2. The current program, per the FY 2014 filing, does not require systems to operate independently from the grid (islanding).

- a. Should islanding and independent operation from the distribution grid be a requirement for public/critical facilities? (see the draft proposed definition below)

JCP&L Response: In order to support the state’s goals to harden the public/critical facilities electric infrastructure, JCP&L believes that the CHP/FC system should only be able to island and operate independently from the distribution grid for emergency situations. Other CHP/FC installations should be designed to meet the needs for the application without additional requirements.

- b. Should this be a requirement with no additional incentive or an additional incentive? What range if any?

JCP&L Response: No additional incentives should be necessary to facilitate the deployment of public/critical facility systems. CHP/FC systems operating independently from the distribution system during emergency situations should be based on the needs of the public/critical facilities' in support of the State's goals.

- c. Should this requirement differ depending on whether the host facility is new construction or existing building (variance of cost)?

JCP&L Response: No, JCP&L recommends that the public/critical facilities CHP/FC system requirements not differ depending on whether the host facility is new construction or an existing building, regardless of the cost difference.

3. The current program requirements per the FY 2014 filing, states that CHP/fuel cell system must be sized to meet all or a portion of the customer's on-site load, not to exceed 100% of most recent historical annual consumption or peak demand, although any surplus power that may become available during the course of a given year may be sold to PJM.

- a. Should the program allow installations that exceed this sizing requirement (for example a system that is designed for 100% of the thermal load and therefore exceed the electric peak demand of the facility)?

JCP&L Response: No, JCP&L recommends that the public/critical facilities CHP/FC system be sized to meet all or a portion of the customer's on-site electric load, not to exceed 100% of most recent historical annual electric energy consumption or peak electric demand, consistent with existing requirements.

- b. Should the NJCEP incentive be limited to only that portion of the CHP/fuel cell that offsets on-site load, or should the incentive cover the additional power for export to the energy market over and above the on-site power needs?

JCP&L Response: See response in 3a. Systems and incentives should be limited to the on-site electric load of the public/critical facility.

Draft Definition of Public and Critical Facilities:

Public and Critical Facilities would be public facilities including federal, state, county or municipal and could include private hospitals or communication centers. The public and critical facilities would include police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities, and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster. The public and critical facilities would be able to provide shelter and sustenance 24/7 during and after an emergency.

JCP&L's proposed definition:

Public and Critical Facilities shall be public facilities owned by the federal, state, county or municipal government, including police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities and private facilities deemed by the State Office of Emergency Management as essential to the health and welfare of the general public in the wake of a disaster. The public and critical facilities shall be documented as certified and demonstrate capability to provide either: 1) shelter and sustenance; 2) fire or police emergency response; 3) life-saving services or 4) potable water supply or waste water treatment 24/7 during and in the wake of a disaster.



VIA ELECTRONIC MAIL (publiccomments@njcleanenergy.com)

July 19, 2013

Mr. Michael Winka
New Jersey Board of Public Utilities
44 So. Clinton Ave., 7th Floor
P.O. Box 350
Trenton, NJ 08625-0350

CHP Working Group Comment Areas

Dear Mr. Winka:

New Jersey Natural Gas Company (“NJNG”) has been actively participating in the New Jersey’s Clean Energy Program (“NJCEP”) Combined Heat and Power and Fuel Cell Working Group (“CHP Working Group”) that was established to support Board of Public Utilities (“BPU” or the “Board”) efforts to advance Distributed Generation (“DG”) within the state. In late June and early July, Board staff has requested stakeholder feedback on a number of policy areas currently under consideration. Through this letter, NJNG wants to provide a few comments related to these policy areas.

Potential for an Islanding requirement

NJNG understands the state’s focus on resiliency in a post–Sandy world and the rationale for proposing that facilities be required to have the capability to island and operate independent from the utility in the event of an outage or failure. NJNG appreciates that the Board is not proposing to implement such a provision on all commercial and industrial CHP projects. Such a requirement could significantly hamper the state’s ability to meet the 1500 MW goal for distributed generation since that requirement could add substantial costs for

these customers and may further limit the market willing to make the investment in such equipment.

NJNG understands the need to consider the merits of such a requirement for projects serving the needs of public or critical facilities. Given NJCEP's primary interest related to these DG projects is rooted in the original objective of increasing the efficiency of a customer's use of energy, it is very important that any new mandates not serve as a disincentive to move ahead with the implementation of the project itself. For many projects, islanding with independent operation requirements could add substantial costs that may have a significant influence on the financial considerations for the construction of the project. Accordingly, it would be very important to identify and offer additional incentives to cover or at least help defray the costs if it is to be established as a requirement. In the absence of any additional incentive for islanding and independent operation, adding this requirement could actually inhibit the number of public and critical facility projects that move forward which would be counter to the clean energy and resiliency objectives. We understand that the Board and other state agencies are actively discussing the potential use of federal funding sources and believe that should be a primary focus for funding this if it is to move forward as a new requirement for public and critical facilities. We recognize that in the absence of federal funding, it may be necessary to look at sources of funding within the state, including NJCEP funds. While this requirement would not result in any incremental energy savings for that particular project, it could support the entities decision to move ahead with construction of the project and would support other societal benefits from the resiliency aspects that could be considered within any cost benefit analysis.

Definition of place

On June 24, 2013 the following was released as a proposed definition for Public and Critical Facilities.

Public and Critical Facilities would be public facilities including federal, state, county or municipal and could include private hospitals or communication centers. The public and critical facilities would include police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities, and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster. The public and critical facilities would be able to provide shelter and sustenance 24/7 during and after an emergency.

NJNG suggests that the use of the word “could” for private hospitals and communication centers may be problematic since there is no guidance provided for those entities to judge whether they may or may not fall within this category. If there are additional criteria intended to consider whether such a potential requirement and related incentives may apply, it would be helpful to provide clarity regarding the conditions that cause these types of private facilities to fall within the Public and Critical Facilities definition. A more transparent roadmap to requirements and incentives for all types of facilities can help mitigate the risk of misinterpretation of such requirements that could lead to unnecessary delays for projects under consideration.

CEEEP Cost Benefit Analysis Assumptions

NJNG wishes to express some concern regarding the underlying data currently being used for the CEEEP Cost Benefit Analysis (“CBA”) for CHP. Based on industry studies and discussions with stakeholders active in the New Jersey CHP market, we believe that many of the cost assumptions for both initial development and construction of CHP Projects, as well as the operations and maintenance of such plants may be significantly understated. It is our understanding that many of the sources relied upon for this analysis are derived from Federal sources or other regions of the country and are not reflective of recent CHP Project experiences within New Jersey. NJNG appreciates that CEEEP has made several appeals through the CHP Working Group in an effort to secure more relevant data but notes that some industry stakeholders appeared to have concerns regarding the confidentiality of such information. Since the results of the CBA may become of a foundation for consideration of related CHP policy initiatives like exploration of a Portfolio Standard and/or refinement of NJCEP CHP incentives, it is critical to have the CBA assumptions reflect recent New Jersey specific data, especially since there could be considerations that may have a significant impact on cost that may not be relevant in other geographic areas (e.g. prevailing wage requirements).

NJNG appreciates the opportunity to provide comments on these topics. Please feel free to contact me if you need any additional information regarding these issues.

Sincerely,

A handwritten signature in black ink, appearing to read "Anne Marie Peracchio". The signature is fluid and cursive, with the first name "Anne" and last name "Peracchio" clearly legible.

Anne-Marie Peracchio
Director- Conservation and Clean Energy Policy

Cc: Elizabeth Ackerman, BPU
Michael Ambrosio, AEG
Mona Mosser, BPU
oce@bpu.state.nj.us



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July 19, 2013

Via Electronic Mail to publiccomments@njcleanenergy.com

Michael Winka, Senior Policy Advisor for Smart Grid
Office of the President
New Jersey Board of Public Utilities
44 South Clinton Avenue
P.O. Box 350
Trenton, New Jersey 08625

Re: CHP/FC Comments

Dear Mr. Winka:

Please accept this letter submitted on behalf of the Rockland Electric Company (“RECO”) in response to the request for comments on the New Jersey Clean Energy Program’s Combined Heat and Power and Fuel Cell program (“CHP-FC program”), distributed by the Board of Public Utilities (“BPU”) on June 24, 2013. Thank you for the opportunity to comment on the CHP-FC program design. RECO would first reiterate its overall view, as described in the attached letter to Mr. Winka, dated May 30, 2013, that CHP and other forms of distributed generation are most beneficial to customers and the grid when installation is in targeted areas where the distribution system either needs or will soon need investment to meet projected electricity demand. RECO also understands that this proposal does not change the CHP-FC program’s budget for the 2014 fiscal year. First, comments are requested on whether the CHP-FC program should provide incentives for a fuel cell that meets the program’s efficiency standards with electric-only output, even if the system in question produces both electricity *and* waste heat. RECO notes that a main objective of the State’s CHP-FC program is to encourage the penetration of distributed generation (“DG”) technologies that capture the benefits of combined electric and thermal energy generation. If a system’s output includes both electricity and waste heat that system should be required to capture the waste heat to improve efficiency. Under current requirements, dual-output systems must achieve a minimum efficiency of 65 percent Lower Heating Value. RECO sees no reason to carve out an exception, and RECO does not see any reason to relax the program’s current combined efficiency standards. A deviation from these standards would contradict the program’s purpose and erode adoption of cost-effective, energy-efficient DG. RECO

* Admitted only in New Jersey

therefore respectfully suggests that the Board maintain the existing efficiency standards that support more cost-effective systems.

The second question is whether CHP or fuel cells that receive incentives under the State's program should be required to operate independently of the grid – referred to as “islanding.” The request further asks whether islanding should be a requirement to receive incentives for CHP and/or fuel cells to be installed at “public and critical” facilities that can provide refuge following disaster events. Typically facilities that install DG use the local utility's delivery and/or back-up services to meet their day-to-day energy needs. RECO believes that if System Benefits Charge (“SBC) funds are to be used to incentivize DG for public and critical facilities, the facilities should be able to begin generating power independently of the grid as a resiliency measure. The CHP system must have the ability to operate during a grid outage. Because additional equipment is often required in order for DG to operate independently of the grid, it is reasonable for the CHP-FC program to provide incremental incentives for facilities that achieve this objective – but only if they qualify as “public and critical facilities” under the Board's proposed definition and are held accountable for their commitment to provide continuously operating centers of refuge (see below for additional comments on the definition of “public and critical facilities”). These incremental incentives should apply equally to all facility types, regardless of whether they are existing buildings or new construction.

The third request for comment explores whether the Board should allow the CHP-FC program to offer incentives for systems that are sized larger than is necessary to meet the customer's onsite load. Currently, the program requires that systems must be sized to meet all or a portion of the customer's onsite load, not to exceed 100 percent of the most recent historical annual consumption or peak demand. This requirement ensures that customer-funded incentives will not be used to subsidize excess electricity generation that provides no additional benefits to the grid or utility customers. Application of CHP-FC incentives to oversized systems would make the program less economically efficient. Furthermore, this approach would enrich customers that are able to install onsite DG, at the expense of all other utility customers. In order to make the most efficient use of customers' SBC contributions, RECO argues that the current sizing requirements should be kept. Customers should make the decision on whether or not to oversize their facilities based on their ability to sell power into the wholesale power markets under their rules, but other customers should not be asked to subsidize this investment. To the extent the utility requests an oversized system as part of its future resiliency planning, this issue can be revisited.

Finally, regarding the definition of “Public and Critical Facilities” for the purposes of qualifying for CHP-FC incentives, RECO suggests that the Board establish standards for how communities would determine that facilities are “essential to the health and welfare

of the population and that are especially important following an emergency.”¹ While RECO in general agrees with the language characterizing such facilities – i.e., “police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities” – it is important that the BPU outline threshold requirements for communities to nominate certain facilities as “Public and Critical.”

Respectfully submitted,



Susan J. Vercheak

Attachment

¹ NJ BPU Request for Comments on CHP-FC Program, dated June 24, 2013:
<http://www.njcleanenergy.com/files/file/CHPFC%20Request%20for%20Comments.pdf>



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Susan Vercheak*
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May 30, 2013

Via Electronic Mail to publiccomments@njcleanenergy.com

Michael Winka, Senior Policy Advisor for Smart Grid
Office of the President
New Jersey Board of Public Utilities
44 South Clinton Avenue
P.O. Box 350
Trenton, New Jersey 08625

Re: Comments by Rockland Electric Company on Straw Proposal for Combined Heat and Power (“CHP”) Long Term Financing Incentive Mechanism, A “Smart” Portfolio Standard

Dear Mr. Winka:

Please accept these comments submitted on behalf of the Rockland Electric Company (“RECO”) regarding the above proposal. While recognizing the preliminary nature of the proposal, RECO appreciates the opportunity to comment.

As an overall matter with respect to CHP, RECO recognizes that this technology can have value particularly for large customers with a high load factor and a need for thermal energy to provide power to non-electric processes. From the electric utility perspective, CHP is most beneficial to customers and the grid as a whole when it is installed in targeted areas where the distribution system is constrained, or on the cusp of needing major upgrades. A targeted approach to CHP growth allows utilities to incorporate CHP into their load relief plans and potentially defer infrastructure upgrades. Staff should therefore work with electric utilities to develop a CHP program that targets CHP installation where it can contribute to the benefit of all utility customers through infrastructure deferrals.

Staff’s proposal calls for establishment of a CHP portfolio standard, which implies that installation of a certain amount of CHP is readily achievable by utilities and customers given the right level of incentives. It has been RECO’s experience in its service territory that the number of customers for whom CHP makes sense is limited. Even on a statewide level, the opportunities for economically-efficient CHP are contained within a narrow population of customers with high load factors and a need for the thermal

*Admitted only in New Jersey

energy that CHPs produce. RECO is therefore concerned that Staff has not adequately evaluated the unique circumstances, and the limits thereof, that are necessary to make CHP a good choice for New Jersey customers.

Given the specialized nature of CHP installations and the limited number of customers that can utilize the substantial thermal load produced by CHP technology, RECO requests that Staff reconsider its proposal to use a binding portfolio standard to meet the State's goal of 1,500 megawatts (MW) of CHP by 2021. A more appropriate policy mechanism might be a targeted CHP program to offer incentives for CHP systems that pass a cost-benefit test that factors in both the individual customer's energy costs and the costs associated with distribution system upgrades that could be deferred. Such a program would give utilities the flexibility to work with customers and pursue the most economically efficient projects available in their service territory as the circumstances allow. It would also avoid the risk of utilities pursuing less-desirable projects simply to meet an arbitrary target that does not account for the individual circumstances present in each region of the state.

RECO is also concerned that the creation of a ratepayer-backed financing mechanism for CHP will effectively mean that non-CHP utility customers will absorb the risk of project failure and/or loan default without gaining commensurate benefits. Non-CHP customers are not likely to experience system benefits from CHP unless the technology is installed in targeted areas that are in need of distribution upgrades. Additionally, the environmental benefits CHP offers small customers are questionable, because CHP is a fossil-fuel driven technology. Depending on the fuel CHP is replacing and the location of the emissions stack, CHP can have a net negative impact on local air quality. To the extent that the proposal is designed for the State to achieve environmental and resiliency goals, there are other options that would benefit a wider range of customers. End-user energy efficiency measures, such as advanced lighting technologies and high-efficiency chiller units are both more cost-effective and environmentally beneficial. Such measures would also contribute directly to the State's goal of reducing overall energy usage. In contrast to CHP, end-use energy efficiency eliminates the need for generating the megawatt hours (MWh) saved and reduces all emissions associated with that generation. While grid-supply MWh savings that result from CHP may make more efficient use of the primary energy (typically natural gas) and may reduce the overall emissions associated with electricity generation, typically CHP does not reduce the customer's electricity usage at the CHP site, and will likely increase local emissions at the CHP location, where air quality in a dense urban environment is already a major concern.

As to resiliency, the effectiveness of CHP is not certain. While an individual CHP customer may have a resilient power source during a major outage, that customer's CHP does not provide power to surrounding neighborhoods after a storm unless the customer has an arrangement with its electric utility to provide dispatchable back-up generation. Moreover, such sites as a storm shelter or major gathering center cannot take advantage of CHP's intrinsic efficiencies because they usually have a low load factor and generally lack a high thermal load. A CHP system installed in a sports arena, for

example, would provide resiliency benefits in the form of shelter and electricity, but at a very high cost that would be subsidized by non-CHP customers. A more cost-effective measure for providing a resilient power source would create incentives for backup generation for large and critical care facilities. Other alternatives include selectively undergrounding power lines or improving vegetation management. RECO suggests that Staff reconsider its narrow focus on CHP systems in its straw proposal, and broaden the range of acceptable back-up generation technologies.

Finally, the proposal to make the CHP requirement “smart” by changing dynamically with market conditions adds regulatory uncertainty and could lead to confusion in the market. Certainly, this concept requires further exploration to develop the means to “take the temperature” of the CHP market given its small size and situation-specific projects.

Thank you for consideration of these comments.

Respectfully submitted,
Rockland Electric Company
By its Attorney,



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CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

STEFANIE A. BRAND
Director

July 19, 2013

Via Regular Mail and Electronic Mail

Honorable Kristi Izzo, Secretary
New Jersey Board of Public Utilities
44 South Clinton Avenue, 9th Floor
P.O. Box 350
Trenton, New Jersey 08625-0350

**Re: Combined Heat and Power/Fuel Cell Working Group
June 24, 2013 Request for Comments on Provisions for NJCEP
CHP/FC Program**

Dear Secretary Izzo:

Enclosed please find an original and ten copies of the Comments submitted on behalf of the New Jersey Division of Rate Counsel ("Rate Counsel") in connection with the above-captioned matter. Copies of the comments are being provided to all parties on the e-service list by electronic mail and hard copies will be provided upon request to our office.

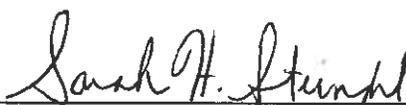
We are enclosing one additional copy of the comments. Please stamp and date the extra copy as "filed" and return it in our self-addressed stamped envelope.

Honorable Kristi Izzo, Secretary
July 19, 2013
Page 2

Thank you for your consideration and assistance.

Respectfully submitted,

STEFANIE A. BRAND
Director, Division of Rate Counsel

By: 
Sarah H. Steindel, Esq.
Assistant Deputy Rate Counsel

Encl.

c: OCE@bpu.state.nj.us
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**Proposed Revisions to the Combined Heat and Power - Fuel Cell Program
Fiscal Year 2014 New Jersey Clean Energy Program**

Initial Comments of the New Jersey
Division of Rate Counsel

July 19, 2013

The Division of Rate Counsel (“Rate Counsel”) would like to thank the Board of Public Utilities (“BPU”) or (“Board”) for the opportunity to present comments on the June 24, 2013 Request for Comments (“RFC”) on specified issues concerning three provisions of the Office of Clean Energy’s (“OCE”) Combined Heat and Power - Fuel Cell (“CHP/FC”) program.

In the sections below, Rate Counsel provides general comments, followed by comments addressing the specific issues set forth in the RFC.

GENERAL COMMENTS

As a preliminary matter, Rate Counsel notes that over the past several years, development of both small and large CHP projects in New Jersey has been minimal despite the availability of seemingly attractive incentives under the previous programs. Before increasing incentive levels as contemplated in this RFC, there should be analysis of the reasons for the poor responses to both the small CHP program managed by TRC and the large CHP program previously managed by EDA, and to identify program features that would remedy any deficiencies found. This analysis should be a formal process evaluation study conducted by an independent entity or entities. Only then will Staff and stakeholders possess enough information to make informed decisions regarding changes to the CHP programs within New Jersey.

Rate Counsel has stated in previous comments, and continues to maintain, that CHP should be economic on its own without ratepayer funded subsidies. However, Rate Counsel recognizes that incentives might be appropriate to develop CHP projects at critical facilities that are intended to provide clearly-defined public benefits.

Within this request for comments is embedded the question of how to value certain characteristics of CHP and fuel cells, such as generation efficiency, emissions, islanding capability, contribution to public welfare during crises, and the ability of a CHP/FC project to generate revenue elsewhere by selling generation or ancillary services on the market. To this end, a competitive solicitation that clearly states the criteria to be used in the ranking and selection of proposals would allow the program administrator to select for desired characteristics of CHP and fuel cells resources. A solicitation would allow CEP to obtain the most cost-effective projects for a set of system characteristics (or obtain the most beneficial traits for a limited amount of funds). Ranking criteria could include requested grant per kW (in dollars), cost benefit ratios (e.g., ratios based on the total resource cost test), other revenue sources (e.g. generation sales, PJM RPM capacity revenue, etc.), capacity factor, proximity to load centers, islanding capability, importance of the project in terms of community resiliency, and emissions characteristics, among others.

COMMENTS ON SPECIFIC ISSUES

RFC Item 1:

The current program requirements, per the FY 2014 filing, states that CHP systems and fuel cells with waste heat recovery must meet 65% Lower Heating Value (LHV) efficiency to qualify for an incentive. Fuel cells that, by design, only output electricity (no waste heat) can meet electric only efficiency of 50% LHV.

a. Should fuel cells with waste heat output be able to qualify on electric efficiency only?

b. If so, should the electric efficiency be less than (or more than) 50% LHV?

c. If less than – what should the requirement be and should the rebate also be reduced?

Rate Counsel Comments:

Rate Counsel notes that the intention behind this part of the RFC is unclear, that is, whether “fuel cells with waste heat output” refers to fuel cells that have waste heat recovery or fuel cells that do not capture waste heat. Rate Counsel assumes that this question asks whether fuel cells that have waste heat recovery but do not meet the 65% LHV efficiency threshold required to qualify for the “with waste heat” incentives (\$4/Watt for fuel cells less than or equal to 1 MW, or \$2/Watt for fuel cells greater than 1 MW) should be allowed to qualify for the lower incentives afforded to fuel cells without waste heat recovery on the basis of electric efficiency only (\$3/Watt for fuel cells less than or equal to 1 MW, or \$1.50/Watt for fuel cells greater than 1 MW). Rate Counsel does not support this suggested change to the current program.

Rate Counsel continues to support the inclusion of fuel cell technologies with heat recovery (i.e., those that are a form of CHP) as part of OCE’s CHP program. However, fuel cell technologies that do not incorporate heat recovery mechanisms do not provide the energy efficiency benefits resulting from concurrent generation of useful thermal output and electricity.

For the same reason, Rate Counsel does not support extending the “with waste heat” incentives to fuel cell systems that do not meet the current 65% LHV efficiency threshold. Such systems do not represent a cost-effective use of CHP, and therefore should not be included within OCE’s program.

RFC Item 2:

The current program, per the FY 2014 filing, does not require systems to operate independently from the grid (islanding).

a. Should islanding and independent operation from the distribution grid be a requirement for public/critical facilities? (see the draft proposed definition below)

b. Should this be a requirement with no additional incentive or an additional incentive? What range if any?

c. Should this requirement differ depending on whether the host facility is new construction or existing building (variance of cost)?

Draft Definition of Public and Critical Facilities:

Public and Critical Facilities would be public facilities including federal, state, county or municipal and could include private hospitals or communication centers. The public and critical facilities would include police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities, and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster. The public and critical facilities would be able to provide shelter and sustenance 24/7 during and after an emergency.

Rate Counsel Comments:

Rate Counsel understands this part of the RFC to request comments on whether systems to be installed in “public and critical facilities” should be required to have the capability of operating independently from the grid (“islanding”) in order to be eligible for incentives, and whether and to what extent there should be financial incentives associated with islanding capability. As used in this context, islanding is when a distributed generator, such as a CHP or

FC unit, disconnects from the grid and continues to provide power for a location in the absence of power from the electric utility.

Whether CHP projects are procured through a competitive solicitation (as recommended by Rate Counsel) or on a rolling basis, OCE must better develop the two distinct goals implied by introducing a requirement that eligible systems have the ability to operate independently of the distribution grid, that is, (1) encouraging development of CHP and (2) promoting islanding capability at critical facilities. OCE should first consider, analyze and present for stakeholder feedback the benefits and costs that are likely to result from concomitantly pursuing these goals, especially if the program implements an add-on incentive for islanding capability. There may be some overlap between facilities that can cost-effectively house CHP units and those that are most important for community resiliency (i.e., critical facilities); for example, hospitals and nursing homes generally have high thermal loads and therefore may represent a good fit for CHP. However, many critical facilities are not likely to be good candidates for CHP. Fire departments, for example, generally do not have high heating loads, and as such they do not generally represent the most cost-effective use of CHP. For this reason, Rate Counsel recommends that every CHP project application for funds should be screened for cost-effectiveness. However, the special nature of CHP projects for critical facilities that provide public benefits could be addressed in the ranking criteria for selecting projects. It is important to screen for cost effectiveness whether applications are processed on a rolling (non-competitive) or a competitive solicitation basis.

Regarding the draft definition of “Public and Critical Facilities”, Rate Counsel observes that the currently proposed definition does a better job of identifying the infrastructure that is most critical in the face of weather-related or other crises, as compared to the broad definition set

forth in the January 31 2013 request for comments. However, Rate Counsel is concerned with inclusion of the following language in the currently proposed definition of “Public and Critical Facilities”: “The public and critical facilities would be able to provide shelter and sustenance 24/7 during and after an emergency.” This language does not comprehensively cover the functions for a wide range of public and critical facilities, and also is poorly suited to some of the facility types mentioned in the definition, such as wastewater treatment facilities. We recommend the definition include “facilities that a community considers essential for the delivery of vital services and for the protection of the community” based on FEMA’s “Design Guide for Improving Critical Facility Safety from Flooding and High Winds.” A full definition from this guide is provided as follows:

Critical facilities commonly include all public and private facilities that a community considers essential for the delivery of vital services and for the protection of the community. They usually include emergency response facilities (fire stations, police stations, rescue squads, and emergency operation centers [EOCs]), custodial facilities (jails and other detention centers, long-term care facilities, hospitals, and other health care facilities), schools, emergency shelters, utilities (water supply, wastewater treatment facilities, and power), communications facilities, and any other assets determined by the community to be of critical importance for the protection of the health and safety of the population. The adverse effects of damaged critical facilities can extend far beyond direct physical damage. Disruption of health care, fire, and police services can impair search and rescue, emergency medical care, and even access to damaged areas. (FEMA 2007.) Design Guide for Improving Critical Facility Safety from Flooding and High Winds. Page 1-2)¹

Moreover, in terms of electric capacity and thermal loads, there is a potentially large mismatch between the needs of facilities for routine and energy-efficient operation on the one hand, and on the other the capacity needed in order to be able to provide shelter and sustenance 24/7 during and after an emergency. Rather than making the ability to provide shelter and

¹ The document is available at <http://wbdg.org/ccb/DHS/fema543.pdf>

sustenance 24/7 during and after an emergency a requirement, it could be considered as a ranking criterion within the competitive bidding construct, such that a CHP/FC proposal for a facility that would enable it to provide shelter and sustenance in the event of an emergency would be preferred to a proposal for a facility that does not seek that capability but reasonably could. For example, a facility that will be able to provide shelter and/or sustenance should not be given priority over, all else held equal, a waste-water treatment facility that cannot reasonably be expected to provide shelter and/or sustenance, but is essential for the delivery of vital public services in the form of treating waste water.

Rate Counsel suggests a revised definition for “Public and Critical Facilities”:

“Public and Critical Facilities” are facilities that a community considers essential for the delivery of vital services and for the protection of the community including facilities that can provide shelter and sustenance 24/7 during and after an emergency.

A proposed CHP or FC system in a facility that meets the final adopted definition of “Public and Critical Facilities” should still be subject to other criteria to determine eligibility for funding or to rank projects competitively. These criteria should include cost-effectiveness, because many critical facilities are not likely to be good candidates for CHP.

The program should not require systems to install islanding equipment if that capability is already in place for back up systems.

As discussed above, additional incentives (including for islanding capability) should not be considered until an evaluation of the existing programs is completed. If the evaluation indicates that additional incentives are warranted, then Rate Counsel would provide comments on the specific incentive structure at that time. However, Rate Counsel notes that a competitive solicitation format would allow for selection of the most cost effective projects with islanding

capability. Moreover, it would not require development of a specific incentive structure to compensate for the cost of islanding capability (including whether it is being installed within new construction or an existing structure).

RFC Item 3:

The current program requirements per the FY 2014 filing, states that CHP/fuel cell system must be sized to meet all or a portion of the customer's on-site load, not to exceed 100% of most recent historical annual consumption or peak demand, although any surplus power that may become available during the course of a given year may be sold to PJM.

a. Should the program allow installations that exceed this sizing requirement (for example a system that is designed for 100% of the thermal load and therefore exceed the electric peak demand of the facility)?

b. Should the NJCEP incentive be limited to only that portion of the CHP/fuel cell that offsets on-site load, or should the incentive cover the additional power for export to the energy market over and above the on-site power needs?

Systems should be sized to meet thermal demands, not electric demands, in order to maximize both thermal and electric benefits and the economics of CHP systems. Constraining the capacity of the system to historical electric consumption or peak demand reduces the economics of CHP systems, e.g. for industrial applications with heavy thermal output. The requirement that electric capacity should not exceed the capacity needed to serve historical annual consumption or peak demand could be one of the barriers to greater development of CHP and should be removed. Rate Counsel recommends lifting the current "100% of annual load" restriction, as long as all excess generation continues to be sold into PJM.

Rate Counsel's recommendation to transition to a solicitation format could easily accommodate any surplus in applications that could result from the removal of the requirement that CHP capacity not exceed 100% of annual historical load, by allowing the program administrator to choose projects that score highest in terms of pre-defined criteria.

Lastly, Rate Counsel does not recommend limiting the incentive to only the portion of the CHP/fuel cell that offsets on-site electric load. CHP incentives should be calculated based on the full capacity of a CHP system, whether or not the system sells excess power to PJM or not.

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July 19, 2013

VIA ELECTRONIC MAIL

Mr. Michael Winka
Senior Policy Advisor
New Jersey Board of Public Utilities
President's Office
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Trenton, New Jersey 08025

Re: CHP/FC Working Group Comments

Dear Mr. Winka:

We represent the Environmental Defense Fund ("EDF") and submit the following written comments regarding the NJCEP Combined Heat and Power ("CHP") and Fuel Cell program on their behalf. EDF is a national non-profit membership organization engaged in linking science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems. EDF has more than 300,000 dues-paying members nationwide and over 10,000 in New Jersey. As an organization, EDF has been active in New Jersey on environmental issues since the 1970's, working on policies ranging from climate change to the preservation of large open spaces like the Highlands, wetland and coastal restoration and oceans. EDF, for example, worked with New Jersey allies, including those in the environmental movement and the New Jersey chapter of the American Lung Association, to attain passage of both the Highlands Preservation Act (2004) and the Clean Car law (2003).

CHP is an important technology for inclusion as part of a diversified portfolio of generation assets within the State of New Jersey. Used in the right setting, CHP, which can be powered by natural gas or renewable fuels, including biomass such as municipal waste or fast growing grasses, generates power and thermal outputs more efficiently than other gas or other

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fossil fuel-fired generators. Waste steam, which would otherwise be vented to the atmosphere, can be used to supply thermal needs or to run additional turbines, increasing the electric output of the plant.

Because CHP can be base loaded and can run around the clock, it can be utilized in situations where intermittent renewable technologies, such as solar and wind power, are not appropriate. CHP can be employed to support public and critical loads during extended emergencies, add support where needed to the utility grid and offer cost reductions for energy supply to off takers when thermal loads are included in the cost/benefit computations. CHP, because its efficient use of fuel, is cleaner and more reliable than diesel-fired back-up generators, which are only tested a limited number of times during the year.

The present day utility grid in New Jersey has been in place for decades and certain parts may date back as far as the middle of the last century or earlier. Certain parts of the grid are fully depreciated as well as outmoded.

The increasing number of severe weather events that have occurred in the past two years, whether hurricanes or other types of storms, further impacts the ability of the grid to continue to serve utility customers and the public as well as desired. Even if all of the requests made by utilities to “harden” the grid were approved in New Jersey,¹ storms of the magnitude of Hurricane Sandy or greater could nonetheless result in storm-related outages of all or discrete portions of the grid, either prior to the completion of all of the required work or thereafter. While EDF is strongly in favor of increasing the amount of renewable, clean energy in the State of New Jersey, intermittent renewable power cannot yet guarantee that there will be sufficient power on a consistent basis during and after an emergency to shelter citizens who are in need, provide food, transportation, medical assistance and communications, among other things. Longer and more intense heat waves that have been experienced in New Jersey require a resilient power system to meet the expanded needs for power delivery. Distributed resources in general, and CHP specifically, are very useful for that purpose.

Following are EDF’s initial responses to the questions posed for comment:

1. With respect to fuel cells, there may be uses for fuel cells in public or critical facilities where CHP is not appropriate or cost effective. As an example, in the aftermath of Hurricane Sandy, large numbers of gas pumps in affected areas were

¹ EDF is not advocating that all requested improvements to the grid to enhance “hardening” should be approved. That issue is addressed in a separate proceeding.

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not operational, crippling the New Jersey workforce, among other things, until power could be restored. For end users, such as small businesses, shelters or governmental facilities that are designated as being of a public or critical nature, that do not have thermal needs or large electric needs, fuel cells might be a viable solution for supplying such a critical service. EDF understands that incentives may be made available for continuing supply of such a critical services. EDF hopes, however, that these supports can be provided without creating adverse environmental impacts. EDF invites further discussion by this Working Group as to whether and where this can be achieved if the fuel cell energy efficiency is less than 50% LHV.

2. With respect to public/critical facilities, EDF is in favor of requiring CHP plants or fuel cells to have the ability to island. Otherwise, in an emergency, whether or not weather-related, the public or critical facilities needed to sustain basic services cannot be guaranteed to be available unless dirtier emergency or standby generation is employed to make power. Because costs associated with equipment that makes islanding possible in public and critical facilities are incurred in substantial part for public purposes, the Office of Clean Energy should provide separate incentives for (1) new construction of CHP or fuel cells and (2) providing islanding capability. Separating the incentives will make it administratively easier to provide incentives to existing plants for adding equipment that enables islanding. Incentives related to islanding should be tied to the costs of providing equipment that enables the plant to island.
3. EDF supports the construction of CHP systems sized to exceed 100% of the peak demand of the facility where they are sited. Sizing a single CHP plant to meet the load of multiple public or critical facilities,² with differing electrical and thermal

² Whether some level of incentive should be available for islanding a non-public or critical facility could depend on factors including whether: (1) the facility could be islanded and continue to run, (2) the facility helps provide jobs and a boost to the State's economy or (3) whether the CHP plant or fuel cell were able to support the grid in an area that is weak, enabling it to continue to provide power depending on the nature and severity of the emergency. EDF notes that in general, the full value of any particular facility, including but not limited to the aforementioned factors, should be considered when applying incentives or examining project cost effectiveness. EDF urges this Working Group to maintain a robust conversation regarding the full value of reliability in the context of Critical Facilities, and ways to capture such values. We look forward to participating in this dialog.

needs, could enable the system to be more cost-effective and valuable to the public. Permitting a developer to build a larger facility and sell power back to the grid could ensure that the plant earns an adequate return, allowing it to be constructed. Especially in cities, where multiple critical facilities, including police and/or fire stations, hospitals, gas stations, supermarkets or other users might be located within a few blocks of each other, users could plan for development of distributed generation sized for a peak load greater than any single facility, with all of the facilities linked through construction of a microgrid.³ The microgrid could be islanded when necessary and could have diverse end users, as well as diverse types of distributed generation.

In New Jersey, if the plant is an on-site generation facility as defined in N.J.S.A. 48:3-51, with off takers located on contiguous property, including property that is separated by an easement, public thoroughfare, transportation or utility-owned right-of-way, is exempt from regulation. However, if the off takers are not located on contiguous property and a thermal load is being served on non-contiguous property, the off-takers may only be served with electricity from the plant if the electricity is wheeled over utility lines, preventing the development of a microgrid that can be disconnected from the grid in such instances. *Id.*

In New York State, the Public Service Commission (“NYPSC”) has approved CHP plants serving more than one end user in a variety of cases, on a case-by-case basis, over the course of the past several years. Chairman Garry Brown recently announced at a NYPSC-sponsored conference that the NYPSC will initiate a Microgrid and CHP docket to investigate issues that stand in the way of expanding the use of these technologies and which could eliminate the need by the PSC to evaluate individually each request for a declaratory ruling to exempt a microgrid from regulation under the Public Service Law.⁴

³ A microgrid has been defined recently in a bill passed by the New York State Legislature and signed into law on March 29, 2013 (Bill No. S2608D, Part T) (“NY S2608D”) as “a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid and can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.”

⁴ Such a proceeding will enable the PSC to carry out the requirements of S2608D which requires that the New York State Energy Research and Development Authority (“NYSERDA”), in consultation with the PSC and the Division of Homeland Security, develop recommendations

One of the case-by-case requests to the NYPSC for such an exemption provides a useful example of how microgrid can be economically employed to make use of output that exceeds the needs of one facility where CHP is sited. There, the NYPSC permitted a CHP plant whose power was distributed over a private microgrid to supply end users located in proximity to one another without subjecting the plant to the Public Service Law. That plant, the Burrstone Energy Center, supplies three neighboring institutions, a 300 bed hospital, a 200 bed nursing home and a college with 1,000 students located in Utica, New York, with electric and thermal from a 3.6 MW cogeneration facility developed together with a microgrid connecting the institutions to the plant. In Case 07-E-0802, Burrstone Energy Center LLC – Petition for a Declaratory Ruling That the Owner and Operator of a Proposed Cogeneration Facility Will Not Be Subject to Commission Jurisdiction, Declaratory Ruling on Exemption from Regulation (issued August 28, 2007) (“Burrstone”), the plant was found to be exempt from regulation even though it served multiple users and the microgrid connecting the facilities crossed one or more streets. While the decision in this case moved in the right direction, EDF supports a more clearly defined regulatory policy regarding microgrid, such as that expected to result from the proposed PSC investigation of microgrids, and looks forward to the development of well-defined policies in New Jersey resulting from discussions in the CHP Stakeholder Working Group.

EDF has reviewed the proposed definition of Public and Critical Facilities and proposes that the definition be both clarified and expanded to allow for a broader range of community assets to be considered. EDF notes that other states, including Connecticut and New York, are also examining “critical facilities” in the context of microgrids and resiliency. Connecticut

regarding, *inter alia*, 1) the regulatory structure under which microgrid systems would operate, 2) the type of microgrid projects that may be implemented, including, but not limited to, distributed generation, combined heat and power; or utilizing renewable technologies such as fuel cells, wind, solar, energy storage, or other energy systems, 3) the technical and regulatory aspect of how a microgrid will be interconnected to the power grid, 4) the adequacy of a microgrid system to operate in emergency situations and that proper protections are in place to ensure operation in the event of an emergency situation, and 5) funding mechanisms that should be considered in order to pay for the establishment, operation and maintenance of such microgrids, including a cost benefit analysis for the development and implementation of microgrids.

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created a definition of the term and included correctional facilities.⁵ NY S2608D, mentioned above, directs NYSEERDA, the NYPSC and the US Department of Homeland Security to recommend whether successful microgrids should be developed in certain facilities.⁶ Further, New York City has allocated \$120 million of its federal Sandy relief funds to enhance 60 community centers in damaged buildings located in certain evacuation zones.⁷ This enhancement is designed to enable the community centers to serve as warming centers, information distribution sites, local command centers, phone charging stations, or emergency shelters in future storms.⁸ In addition, certain types of businesses located in communities may play a role in meeting citizen's fundamental needs (such as food, shelter, and medical care) in the immediate aftermath of a disaster.

Thus, EDF, while not purporting to be emergency managers, offers suggestions to the Critical Facilities definition as follows and invites a broad stakeholder dialog on this topic:

“Public and Critical Facilities would be public facilities including federal, state, county or municipal and could include private hospitals or communication centers. The public and critical facilities would include police stations, fire and rescue facilities,

⁵ Connecticut Senate Bill No. 23, Public Act No. 12-148, June 15, 2012 provides that critical facility "means any hospital, police station, fire station, water treatment plant, sewage treatment plant, public shelter or correctional facility, any commercial area of a municipality, a municipal center, as identified by the chief elected official of any municipality, or any other facility or area identified by the Department of Energy and Environmental Protection as critical.”

⁶ NY S2608D directs an examination of “Whether hospitals, first responder headquarters, such as police and fire stations, emergency shelters, schools, water filtration plants, sewage treatment plants, municipalities, commercial entities, and other locations in the state of New York may desire to collaborate on successful microgrids.”

⁷ The City of New York Community Development Block Grant-Disaster Recover Partial Action Plan A for CDBG-DR Funds per the Disaster Relief Appropriations Act of 2013 (Public Law 113-2, January 29, 2013) at 44, available at http://www.nyc.gov/html/cdbg/downloads/pdf/cdbg-dr_full.pdf (last visited July 19, 2013). These amounts are dedicated to centers in public housing damaged by Sandy; additional funds are allocated to enhance public housing centers that were not damaged by Sandy in addition to funds New York City has allocated to centers not located in public housing.

⁸ *Id.*

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hospitals, shelters, schools, nursing homes, correctional facilities, water supply and waste treatment facilities, and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster, which may include, without limitation, community centers, grocery stores, pharmacies, and gas stations. The public and critical facilities would be able to provide shelter, safety, and sustenance 24/7 during and after an emergency.”

EDF thanks the Office of Clean Energy and the BPU for the opportunity to submit the foregoing comments.

Very truly yours,



Phyllis J. Kessler

pjk

Michael Winka
Senior Policy Advisor, New Jersey Bureau of Public Utilities
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July 22, 2013

Re: CEEEP CHP Cost/ Benefit Analysis

Dear Mr. Winka:

Nexant applauds the effort the State of New Jersey is taking to promote CHP, as it will be a powerful tool as it continues to distribute its electric generation locations and harden the states infrastructure at critical facilities. Nexant possesses deep domain knowledge in CHP centered on energy efficiency credits, as well as project development capabilities; most recently myself and a colleague Dr. Paul MacGregor testified at a Senate Energy Committee hearing.

I am contacting you today to publicly comment on the underlying assumptions used within Cost / Benefit Analysis method created by CEEEP; specifically on the following components

1. The Total Installed Cost per KW related to Reciprocating Engines and Gas Turbines
2. Operations and Maintenance Costs per kWh

Total Installed Costs per KW

The estimates provided by ICF International, SENTECH Incorporated and EPA CHP Catalog are significantly lower than what is reality in the marketplace. Within the smaller the systems, the more egregious these estimates appear. As an experienced developer who has completed many feasibility studies, for systems under 1MW, the total all-in installed cost is greater than \$2,500 per KW. I recognize there are numerous variables that determined installations cost, however I would contend that total install costs of less than \$2,000 KW for projects under 1MW is not feasible. Due to the fact the majority CHP projects to be installed in NJ will be less than 2MW, additional focus should be used to determine more realistic costs assumptions.

Operations and Maintenance Costs

CHP Service Level Agreements vary greatly from one vendor to another, comparing costs per kWh is difficult. However, for all of our clients we recommend that they employ a "full service approach" as opposed to strictly a time and materials contract. This requires a higher cost per kWh, which typically resides around \$.025 kWh for systems less than 1MW. The estimates provided by ICF, SENTECH and EPA CHP appear to be on Time and Materials basis. If this is true, the total maintenance cost is neglecting to account for major work, such as Top End overhauls that are required after a certain number of hours of use, where the costs can be substantial.

Please do not hesitate to contact me if you have any questions or require additional information in connection with the CHP Cost/Benefit Analysis.

Respectfully,



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